

This equipment complies
with the EMC Directive
89/336/EEC

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Issue 1

Part No. ZZ2791

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R31	MF 0.25W RES 2% 82R	AD0423
R32	MF 0.25W RES 2% 2K7	AD0459
R33	MF 0.25W RES 2% 4K7	AD0465
R51	MF 0.25W RES 2% 240R	AD0434
R52	MF 0.25W RES 2% 1K	AD0449
R53	MF 0.25W RES 2% 680R	AD0445
R61	MF 0.25W RES 2% 240R	AD0434
R62	MF 0.25W RES 2% 1K	AD0449
R63	MF 0.25W RES 2% 680R	AD0445
R71	MF 0.25W RES 2% 120R	AD0427
R72	MF 0.25W RES 2% 1K3	AD0452
R73	MF 0.25W RES 2% 1K6	AD0454
R74	MF 0.25W RES 2% 1K3	AD0452
R75	MF 0.25W RES 2% 1K3	AD0452
R81	MF 0.25W RES 2% 120R	AD0427
R82	MF 0.25W RES 2% 1K3	AD0452
R83	MF 0.25W RES 2% 1K6	AD0454
RG1	THERMALLOY T03 SKT	ZC0221
RG2	THERMALLOY T03 SKT	ZC0221
RG5	THERMALLOY T03 SKT	ZC0221
RG6	THERMALLOY T03 SKT	ZC0221
RG7	THERMALLOY T03 SKT	ZC0221
RG8	THERMALLOY T03 SKT	ZC0221
SC3136	CPS650/B PSU PCB	GA3136
TR5	NPN TRANS 2SC2240BL(TAPED)	BD0302
TR6	PNP TRANS 2SA970GR (TAPED)	BD0301
	5X20MM T1AX250V FUSE !	ZD8001
	5X20MM T3.15X250V FUSE !	ZD8003
	5X20MM T5AX250V AS FUSE !	ZD8005
	5X20MM T6.3AX250V FUSE !	ZD8006
	5X20MM T8AX250V AS. FUSE!	ZD8008
	FUSE CARRIER 5X20MM	ZD0328
	ITW VOLTAGE SELECTOR SWT !	DJ8000
	SERIAL NUMBER LABEL	ZA0083

Electro-Mech. Assembly

IDENT	DESCRIPTION	PART No.
MD4979	CPS450/650 EXTRUDED HEATSINK	PN1225
MD5062	CPS650/450 HEATSINK BRKT LONG	PP2723
MD5063	CPS650 HEATSINK BRKT SHORT	PP2765
REG1	V.REG LM338K+1.2/32V 5A (T03)	BE0438
REG2	V.REG LM338K+1.2/32V 5A (T03)	BE0438
REG7	V.REG LT1083CK 5A (T03)	BE0473
REG8	V.REG LT1083CK 5A (T03)	BE0473
	2BA S/PROOF WASHER	NC0202
	30CMX30CM THERMALLY CONDCTV SHT	ZC0223
	BDG RECT BR152 200V 15A	BC0210
	CPS650 PSU LED WFM	RV2067
	CPS650 PSU PCB ASSY	RA3136
	KOOL PAD LM317T/337T	ZC0217
	KOOL PAD T03	ZC0219
	M3 X 8MM PAN POZI BLCK SCRW	NA0130
	M3X16MM PAN POZI SCRW ZNC	NA0245
	M3X3/8" CLEARANCE METAL SPACER	ND0347
	M5 X 12 PAN/POZI SCREWS	NA0159
	M5X16MM PAN POZI SCREW	NA0092
	NO4X1 3/4"HEX SPACER	ND0346
	NO4X3/8" PAN POZI S/T BLK SCRW	NA0249
	TIP INS BUSH	ZC0215
	V.REG LM317K+1.2/37V 1.5A(T03)	BE0419

Warranty

SOUNDCRAFT RECOMMENDED WARRANTY

This warranty applies to sales within the UK and should form the basis of the warranty offered by the overseas vendor of Soundcraft products.

Soundcraft means Soundcraft Electronics Ltd.

End User means the person who first puts the equipment into regular

Dealer means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distributor.

Equipment means the equipment supplied with this manual.

If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship (but not faulty design) to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or at its option replace the defective components. Any components replaced will become the property of Soundcraft. Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.

This warranty shall only be available if:-

- a) The Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and
- b) The End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and
- c) No persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and
- d) The End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance with Soundcraft's recommendations.

Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.

The benefit of this Warranty may not be assigned by the End User.

End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.

SOUNDCRAFT CPS650/B

Console Power Supply

User and Technical Manual



IMPORTANT: please read this manual carefully before connecting your Soundcraft console power supply to the mains for the first time.

PSU PCB Assembly

CPS650/B PSU PCB Assembly		RA3136
IDENT	DESCRIPTION	PART No.
RP1	CPS450/650 PSU REGULATOR WFM	RV2071
RP2	CPS450/650 PSU REGULATOR WFM	RV2071
RP3	CPS450/650 PSU REGULATOR WFM	RV2071
C1	VERT ELEC 10MM 10,000MF/40V	CE0427
C2	MICRO-BOX 5MM 5% 100V 100N	CC0250
C3	VERT ELEC 0.2" 47UF 63V	CE0402
C4	VERT ELEC 5MM 100MF/63V	CE0430
C21	VERT ELEC 10MM 10,000MF/40V	CE0427
C22	MICRO-BOX 5MM 5% 100V 100N	CC0250
C23	VERT ELEC 0.2" 47UF 63V	CE0402
C24	VERT ELEC 5MM 100MF/63V	CE0430
C31	VERT ELEC 10MM 1000MF/100V	CE0426
C32	MICRO-BOX 5MM 5% 100V 100N	CC0250
C33	VERT ELEC 0.2" 47UF 63V	CE0402
C34	VERT ELEC 5MM 220MF/63V	CE0429
C51	VERT ELEC 10MM 4700UF 16V	CE0415
C52	MICRO-BOX 5MM 5% 100V 100N	CC0250
C53	VERT ELEC 0.2" TPD 47MF 25V	CE0401
C54	VERT ELEC 5MM 100MF/63V	CE0430
C61	VERT ELEC 10MM 4700UF 16V	CE0415
C62	MICRO-BOX 5MM 5% 100V 100N	CC0250
C63	VERT ELEC 0.2" TPD 47MF 25V	CE0401
C64	VERT ELEC 5MM 100MF/63V	CE0430
C71	VERT ELEC 10MM 4700UF 50V	CE0414
C72	MICRO-BOX 5MM 5% 100V 100N	CC0250
C73	VERT ELEC 0.2" TPD 47MF 25V	CE0401
C73	VERT ELEC 0.2"TPD L-L 10MF 25V	CE0417
C74	VERT ELEC 5MM 220MF/63V	CE0429
C75	VERT ELEC 10MM 4700UF 50V	CE0414
C81	VERT ELEC 10MM 4700UF 50V	CE0414
C82	MICRO-BOX 5MM 5% 100V 100N	CC0250
C83	VERT ELEC 0.2" TPD 47MF 25V	CE0401
C83	VERT ELEC 0.2"TPD L-L 10MF 25V	CE0417
C84	VERT ELEC 5MM 220MF/63V	CE0429
C85	VERT ELEC 10MM 4700UF 50V	CE0414
CON1	BICC-VERO .2"10WY R/A HDR	FF0735
CON1	NO6X1/4"PAN POZI S/T TYPE B	NA0137
CON2	BICC-VERO .2"6WY VERT HDR	FF0730
CON2	NO6X1/4"PAN POZI S/T TYPE B	NA0137
CON3	BICC-VERO .2"6WY VERT HDR	FF0730
CON3	NO6X1/4"PAN POZI S/T TYPE B	NA0137
CON4	MTHD .1" 4WY VERT LCKG ML HDR	FF0638
CON5	BICC-VERO .2"6WY VERT HDR	FF0730
CON5	NO6X1/4"PAN POZI S/T TYPE B	NA0137
CON6	MTHD .1" 4WY VERT LCKG ML HDR	FF0638
D1	DIODE 1N4001	BA0005
D2	DIODE 1N4001	BA0005
D3	DIODE RL/MR752 200V 6A PRFM.6"	BA0007
D4	DIODE RL/MR752 200V 6A PRFM.6"	BA0007
D5	DIODE RL/MR752 200V 6A PRFM.6"	BA0007
D6	DIODE RL/MR752 200V 6A PRFM.6"	BA0007
D8	DIODE 1N4001	BA0005
D21	DIODE 1N4001	BA0005
D22	DIODE 1N4001	BA0005
D23	DIODE RL/MR752 200V 6A PRFM.6"	BA0007
D24	DIODE RL/MR752 200V 6A PRFM.6"	BA0007
D25	DIODE RL/MR752 200V 6A PRFM.6"	BA0007

D26	DIODE RL/MR752 200V 6A PRFM.6"	BA0007
D31	DIODE 1N4001	BA0005
D32	DIODE 1N4001	BA0005
D33	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D34	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D35	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D36	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D51	DIODE 1N4001	BA0005
D52	DIODE 1N4001	BA0005
D53	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D54	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D55	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D56	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D61	DIODE 1N4001	BA0005
D62	DIODE 1N4001	BA0005
D63	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D64	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D65	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D66	DIODE IN5402 200V 3A PRFMD .6"	BA0009
D71	DIODE 1N4001	BA0005
D72	DIODE 1N4001	BA0005
D81	DIODE 1N4001	BA0005
D82	DIODE 1N4001	BA0005
F1	SCHURTER FUSE CLIP!	ZD0317
F2	SCHURTER FUSE CLIP!	ZD0317
F3	SCHURTER FUSE CLIP!	ZD0317
F5	SCHURTER FUSE CLIP!	ZD0317
F6	SCHURTER FUSE CLIP!	ZD0317
F7	SCHURTER FUSE CLIP!	ZD0317
F8	SCHURTER FUSE CLIP!	ZD0317
LED1	HOLDER FOR 5MM LED PC MNT	ZC0222
LED1	T1 3/4 5MM LED GREEN	JA0034
LED2	HOLDER FOR 5MM LED PC MNT	ZC0222
LED2	T1 3/4 5MM LED GREEN	JA0034
LED3	HOLDER FOR 5MM LED PC MNT	ZC0222
LED3	T1 3/4 5MM LED GREEN	JA0034
LED5	HOLDER FOR 5MM LED PC MNT	ZC0222
LED5	T1 3/4 5MM LED GREEN	JA0034
LED6	HOLDER FOR 5MM LED PC MNT	ZC0222
LED6	T1 3/4 5MM LED GREEN	JA0034
LED7	HOLDER FOR 5MM LED PC MNT	ZC0222
LED7	T1 3/4 5MM LED GREEN	JA0034
LED8	HOLDER FOR 5MM LED PC MNT	ZC0222
LED8	T1 3/4 5MM LED GREEN	JA0034
PAD7	32/0.2 BROWN WIRE	LA0014
PAD70	32/0.2 GREEN WIRE	LA0015
PAD80	32/0.2 BLUE WIRE	LA0013
PR1	CERMET TRIMMER HORIZ 1K	DE0425
PR2	CERMET TRIMMER HORIZ 1K	DE0425
PR3	CERMET TRIMMER HORIZ 90H 470R	DE0407
PR5	CERMET TRIMMER HORIZ 90H 470R	DE0407
PR6	CERMET TRIMMER HORIZ 90H 470R	DE0407
PR7	CERMET TRIMMER HORIZ 90H 470R	DE0407
PR8	CERMET TRIMMER HORIZ 90H 470R	DE0407
R1	MF 0.25W RES 2% 120R	AD0427
R2	MF 0.25W RES 2% 1K8	AD0455
R3	MF 0.25W RES 2% 2K2	AD0457
R21	MF 0.25W RES 2% 120R	AD0427
R22	MF 0.25W RES 2% 1K8	AD0455
R23	MF 0.25W RES 2% 2K2	AD0457

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Description

The CPS650/B is a linear power supply which, like other linear supplies, produces DC voltages by rectifying, smoothing and regulating AC voltages from the secondary windings of a mains transformer. Soundcraft mixing consoles employ a number of dc voltage supply levels in their operation and these are all provided at the output of each supply unit.

In regulating these voltages there is considerable heat generated, the dissipation of which is achieved through a substantial heat sink on each side of the unit. The case will become quite hot under normal operating conditions.

The CPS650/B is designed for installation in a 19" rack unit and is provided with the necessary fixing holes for this, but can also be free standing. Refer to the section "RECOMMENDATIONS FOR INSTALLATION" on Page 5.

LED indication is provided on the front panel for operation of the regulating circuits.

MAINS VOLTAGE SELECTION

Special attention should be paid to the following information:



Do not change the voltage setting without first turning the unit off and unplugging the mains lead. Ensure that all three blanking plugs on the lid are replaced after correct voltage selection has been made.

This unit is capable of operating over a wide range of mains voltages by means of a comprehensive set of selectable voltage settings. It is important to ensure that the correct voltage setting has been selected for the level of local mains voltage supply, for safe, uninterrupted operation of the unit.

There are three mains voltage selection switches inside the top of the unit, which are accessed by removing the blanking plugs that cover them.

DO NOT DISCARD THE BLANKING PLUGS

Voltage selection is achieved by moving the switches using a screwdriver blade, into the correct positions, as shown by the symbols to the side of the access holes. In this way the unit is set up for operation at one of the following ranges of mains supply:

NOMINAL VOLTAGE	OPERATING VOLTAGE RANGE
<i>Vrms AC</i>	<i>Vrms AC</i>
240 UK	216-264
220 EUROPE	198-242
200	180-220
120	108-132
110 USA	99-121
100	90-110
90	81-99

Spare Parts Lists

CPS650 Main Assembly RW1370

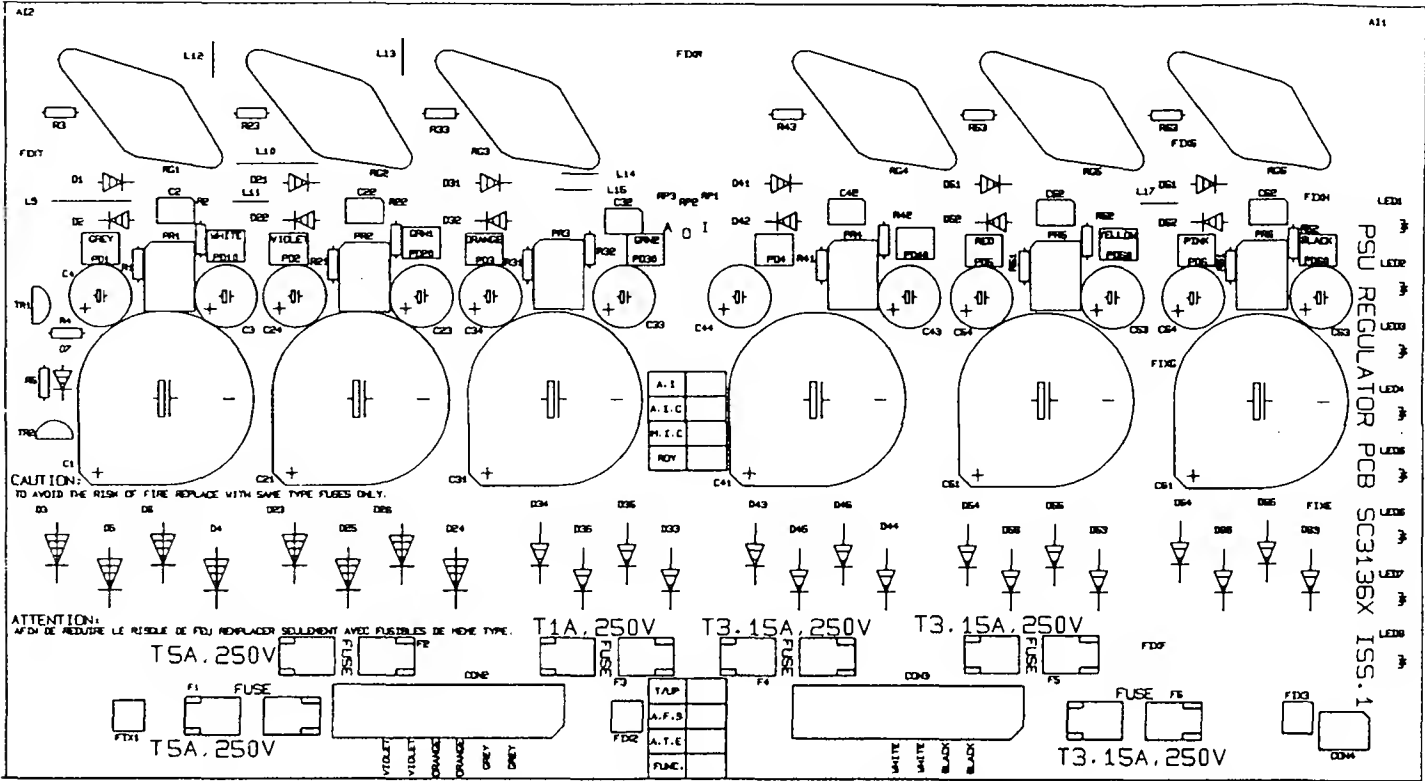
PSU PCB Assembly RA3136

Electro-Mechanical Assy. RS5348

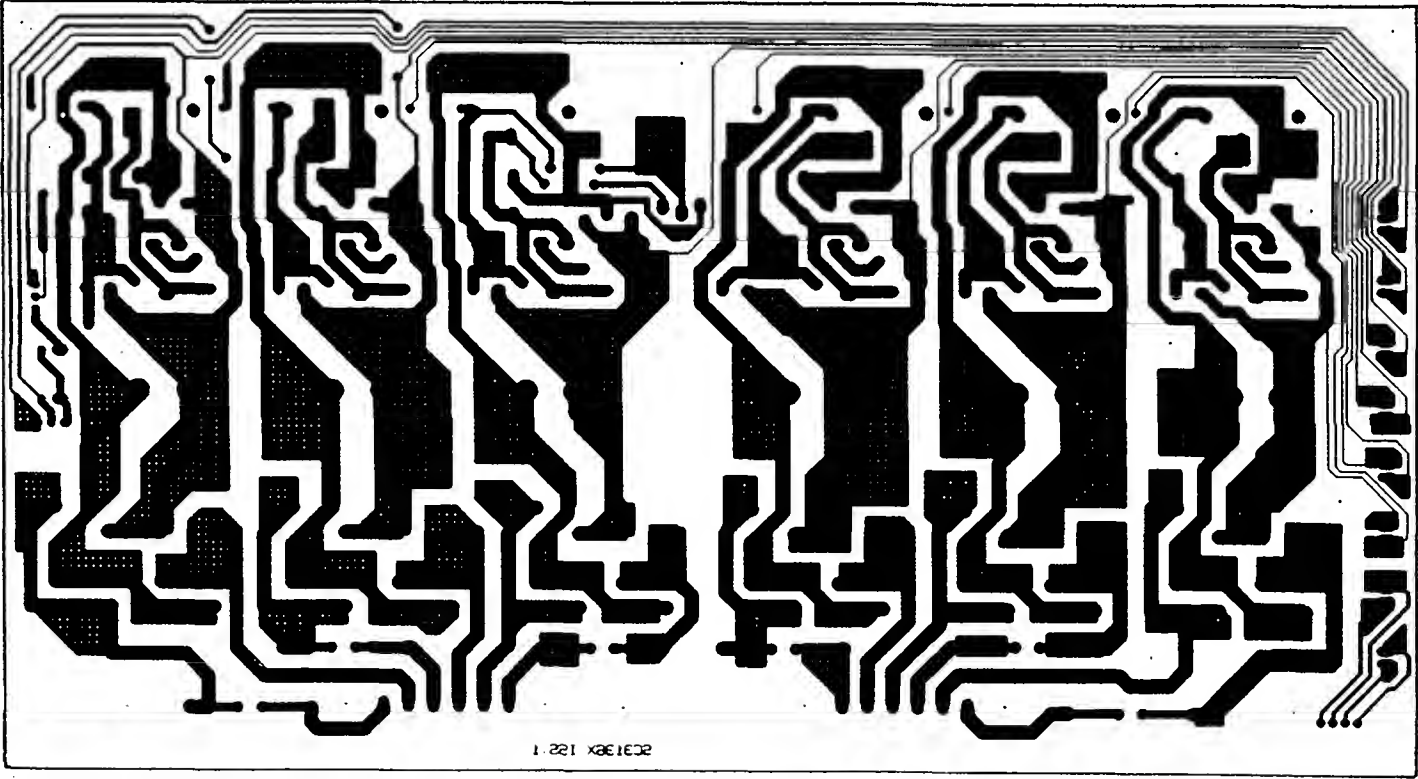
Spare Parts

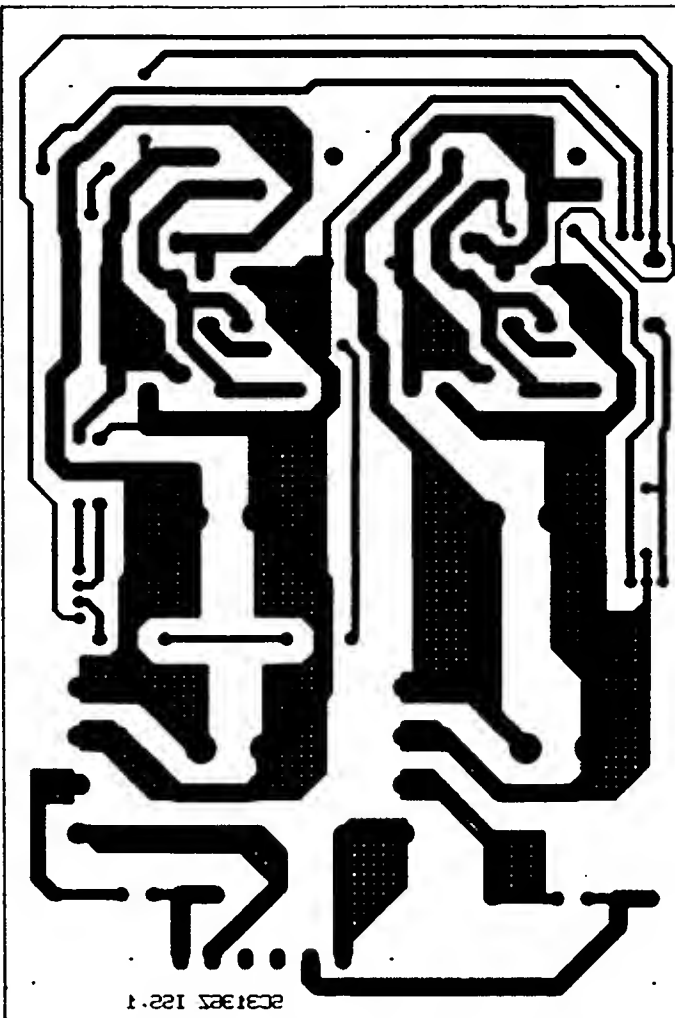
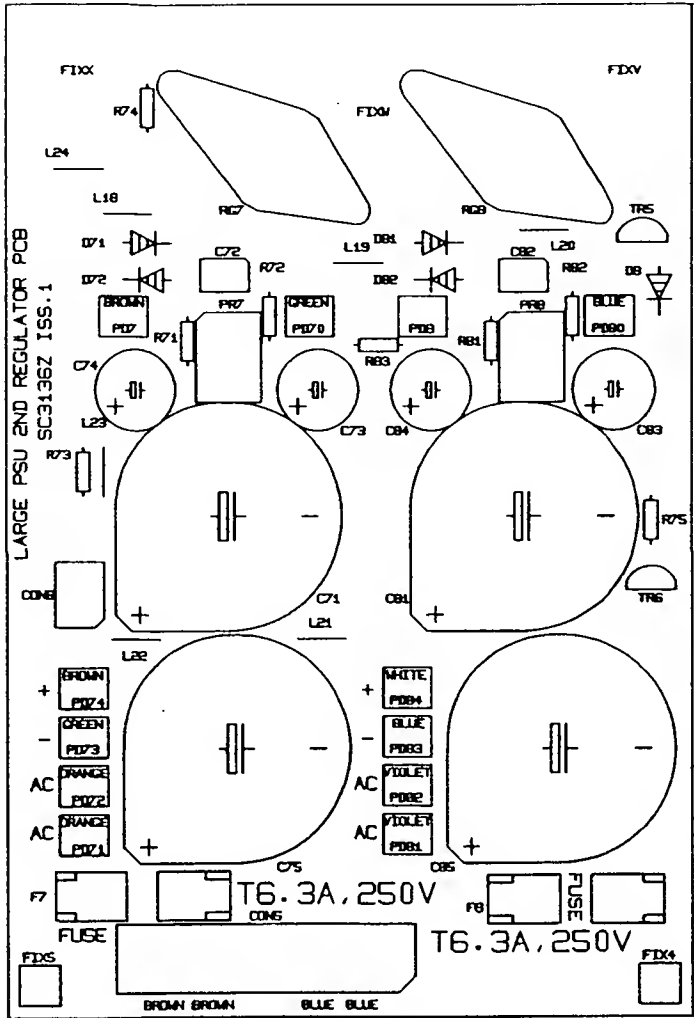
CPS650/B Power Supply			CPS650/B Power Supply Assembly	RW1370
IDENT	DESCRIPTION	PART No.		
MD4975	CPS450-650 PSU CHASSIS	PG1010		
MD6392	CPS650/B FRONT FACIA PANEL	PJ1190		
MD6394	CPSX50/B PSU COVER	PJ1192		
MD6395	CPSX50/B COVER PLATE	PB0561		
	"THIS WAY UP"LABEL SLF-ADH	ZA0084		
	'FRAGILE LABEL' SELF ADHESIVE	ZA0075		
	3/8"X16MM INT TEETH LCK WASHER	NC0247		
	3BA RING CRIMP TERMINAL	FG0634		
	5X20MM T6.3AX250V FUSE	ZD8006		
	BICC-VERO .2" 10WY FML HSNG	FF0736		
	BICC-VERO .2"6WY FML HOUSING	FF0731		
	CABLE LOC KLB-450B:RICH0	ZZ2623		
	CABLE TIE 4.3"	LF0501		
	CPS450/650 PSU FOAM END CAP	TB0152		
	CPS450/650 PSU WFM KIT	RV2065		
	CPS650 16WY PSU LEAD	RV2069		
	CPS650 ELECTRO-MECH ASSY ISS 3	RS5348		
	CPS650/450 PSU CABLE TRAY	TA0126		
	CPS650/450 PSU CARTON	TA0125		
	CPS650/B MANUAL	ZZ2791		
	CPS650/B TRANSFORMER ASSY	HB0155		
	H20X20MM HELSYN SLEEVE BLUE	LF0512		
	M3 NYLON INSERT NUT	NB0113		
	M3 X 8MM PAN POZI PLTD SCREW	NA0116		
	M3.5 BLACK NYLON WASHER	NC0232		
	M4 BLACK PLASTIC WASHER	NC0250		
	M4 NYLON INSERT NUT	NB0127		
	M4 PLAIN STEEL WASHER ZNC CLR	NC0249		
	M4X10MM RICHCO PCB SUPPORT	ZZ2545		
	M4X16MM PAN POZI BLACK SCR	NA0251		
	M4X3/8" RICHCO LCKNG PCB SUPPRT	ZZ2553		
	M8X25MM BUTTON HEAD SKT SCRW	NA0252		
	NO6 SPIRE CLIP SNU1219-17-4	NZ2249		
	NO6X3/8" TYP B PAN POZI BLK SCR	NA0250		
	NON ILL.RK SWT DPST(2600M11E)!	DL8000		
	PNL MNT IEC MNS SKT!	FJ8000		
	PSU EARTH SYMBOL SLF-ADH	ZA0078		
	RICH0 SCREW ON PLASTIC FEET	ZZ2541		
	S/ADHSV CBL TIE BASE 29X29MM	LF0504		
	SCHRTR FUSEHOLDR F100031-1362!	ZD8011		
	SERIAL NUMBER LABEL	ZA0083		
	SHRTR FUSECARR'R FEK0031-1371!	ZD8012		
	SILICA GEL DESSICANT 50 GRAM	ZZ2264		
	SIZE16 TWO PART CONTACT-RLD	FG0638		

Description



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OPERATING VOLTAGE RANGE

A wide operating range of mains voltages is provided to enable the unit to function down to only 81Vrms on the mains supply. This facility is incorporated to overcome the problems that some power supplies have with internal regulation when operating from a poorly regulated mains supply.

In any situation where the nominal mains level is 100V AC but poor mains regulation is suspected, measure the r.m.s. level using an AC voltmeter. If the observed voltage is at 90V or below, then the 90V position should be selected before connecting the unit to the mains supply.



Do not change the voltage setting without first turning the unit off and unplugging the mains lead. Replace all three blanking plugs after correct voltage selection has been made.

REPLACING MAINS FUSE

In the event of incorrect switching of the mains voltage selectors, a mains power surge or underrated fuse value, the mains fuse in the front panel will blow and the CPS650/B will not function. Switch the ON/OFF switch to the OFF position. Check the fuse and replace if necessary; also check that the voltage selection is correct for the mains supply level before switching the unit ON again.

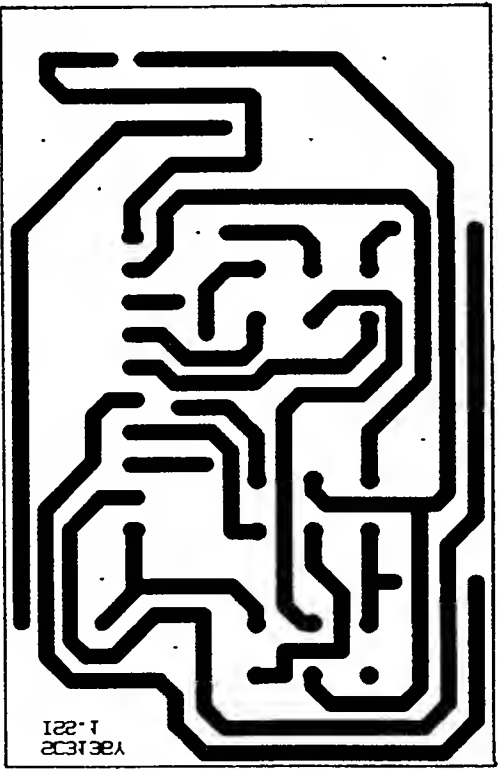
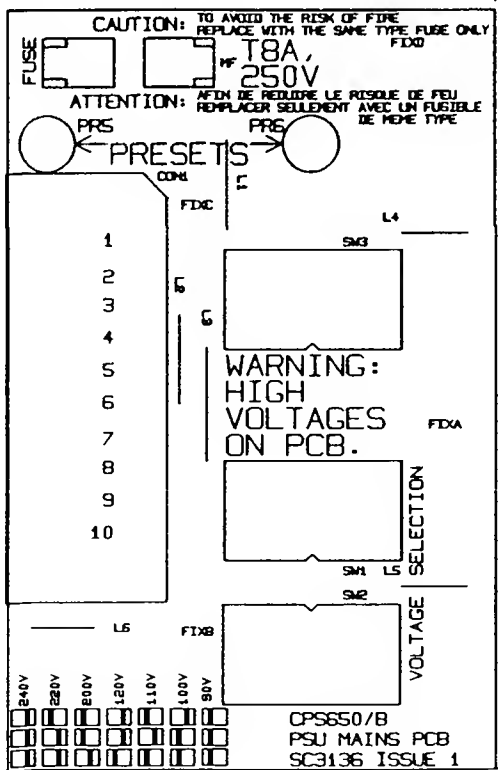


To avoid risk of fire replace only with the correct value fuse, as indicated on the unit.

In the event of repeated failure of the mains fuse consult the Soundcraft dealer from where the unit was purchased.



This unit contains no user serviceable parts. Refer all servicing to a qualified service engineer, through the appropriate Soundcraft dealer.



Recommendations for Installation

The CPS650/B power supply is provided with front panel fixing holes for 19" rack-mounting and will occupy 2U of rack space when the four feet are removed from the base of the unit. These unscrew and can be press-fitted back onto the unit as necessary. It is not necessary to get inside the PSU to perform this operation. The feet have an expanding clamp system to hold them into the base of the PSU: unscrewing contracts the clamp and enables removal, screwing expands the clamp.

As with any power supply that contains a large mains-voltage transformer, it is preferable to provide a degree of physical isolation of the unit from other electronic equipment, particularly that which carries low level audio signals, to avoid any possible hum pick-up. For this reason the unit is provided with a long (6.5 metres) output cable to enable it to be positioned away from the mixing console.

For the same reason, when rack-mounting it is preferable to avoid locating the unit adjacent to signal processing equipment.

It should be noted that if a complete rack containing a CPS650/B unit is to be operated from a different mains supply level, then the unit should be withdrawn from the rack in order to reselect the mains voltage setting, at the same time as resetting any other equipment.

The other important consideration when rack-mounting the unit is the need for natural convection of air over the heatsink cooling fins.

Good ventilation BELOW the unit, in the floor or back of the rack, and similarly ABOVE the unit, at the top of the rack, will ensure a path for continuous air flow.

Other equipment in the rack which is known NOT to produce a significant amount of heat should be mounted BELOW the unit. Equipment that also relies on good air flow within the rack (ie. most power amplifiers and other power supplies) should be given due consideration and some space should be provided between such units and between these and the CPS650/B unit(s). Forced convection, by means of a fan-tray, may be desirable in this situation.



The CPS650/B will operate as a free-standing unit without requiring any special cooling arrangement, but should not be allowed to be accidentally or deliberately covered over in any way.

Finally, some consideration should be given to the earthing arrangement of the system at the centre of which are the console and the CPS650/B (and any other Soundcraft power supply units). The console chassis is earthed, through the mains earth, via the power supply. When rack-mounting the CPS650/B (and any other Soundcraft power supply units) care should be taken to avoid any possible 'ground loops' in the system which would introduce audible hum to otherwise clean audio signals. Ground loops may occur where signal processing equipment, patched to the console, has its signal earth commoned to the equipment chassis. The ground loop is formed if this chassis and the power supply chassis are in electrical contact through the fixing rails they share in the rack. To avoid this situation, standard isolating washers may be employed when fixing the power supply (or supplies) or any other unit into the rack.



W A R N I N G : under no circumstances should the mains earth be disconnected from the CPS650/B power supply unit.

The +48V regulator is a TL783C high voltage device housed in a TO220 package. It can be removed by first drawing back the sleeve on the centre leg, desoldering the 3 wires and unscrewing the M3 fixing screw, taking care to retain the small insulating bush beneath the head of the screw. Again, an insulating SIL PAD is used, and this should be replaced if it appears to be damaged. The metal tag at the top of the package is at the output potential of the device, as is the centre lead. When refixing or replacing the device, it is easier to screw the device down before resoldering the wires to the leads. Draw the sleeve back over the centre lead afterwards.

NOTE : The heatsink bracket is earthed through its mechanical contact with the rest of the chassis and so a faulty SIL PAD may cause the output of its regulator to be connected to earth. In the case of a positive voltage rail the output then becomes short circuited when the mixing console is connected. In this case the regulator will shut down safely, and the associated front-panel LED will not light. In the case of a negative voltage rail the regulator output is normally earthed at the console anyway, and so a faulty SIL PAD may not be so apparent. It may, however, affect the noise performance of the supply rail by producing a ground loop. This can be checked against the maximum expected noise figures listed in the Technical Specification. Alternatively, if necessary the negative supply rail can be isolated from its complementary positive rail by removing the link on the circuit board, and an individual load can be applied across the output of the supply rail with the "0V" reference side commoned to the chassis. The front-panel LED will not light if the output is short-circuited.

To replace any other components in a regulation circuit it is necessary to withdraw the circuit board and heatsink sub-assembly from the unit.

First unscrew the four outer M4 fixing screws and washers on the front of the unit and remove the front panel. Next, unscrew the four main M4 heatsink-fixing screws, two at the front and two at the back. Withdraw the large black connector(s) from their sockets on the board. Using a pair of pliers, close the locking PCB supports near the edge of the board, at the same time lifting the PCB up above each latch, and withdraw the complete assembly until the back edge of the heatsink clears the chassis. The assembly should then be drawn backwards so that the LEDs clear the front panel and it may then be fully withdrawn from the unit.

After servicing these circuits, be sure to screw the mains board FIRMLY back onto the regulator board.

After servicing, re-assemble the unit in reverse order to the above, ensuring that all screws are fixed tightly and that the PCB supports are latched onto the board. Re-dress cable forms in their original positions and secure where applicable with cable ties.

GENERAL

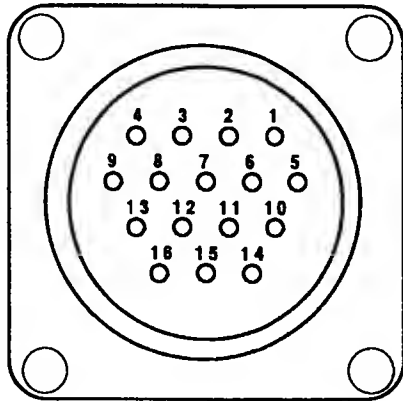
Before replacing the top cover on the unit, carefully remove any dust from surfaces within the unit.



Carefully check all wiring connections and ensure that there are no loose parts lying around inside the unit.

Connector Configuration: 16-Way SRC

16-Way SRC Connector
Viewed from the rear
(inside CPS 650/B)



PIN No.	Wire Colour	Description
1	Brown	+17 Volts
2	Red	+7.5 Volts No. 1
3	Blue	-17 Volts
4	Green/Yell. Sleeve	+/-17 Volts(GND)
5	Black	+7.5 Volts No. 2(GND)
6	Yellow	+7.5 Volts No. 1(GND)
7	White	+24 Volts No. 2(GND)
8	Violet	+24 Volts No. 1
9	Pink	+7.5 Volts No. 2
10	Orange	+48 Volts
11	Grey	+24 Volts No. 2
12	Green/Blue sleeve	+24 Volts No. 1(GND)
13	Green/Pink sleeve	+48 Volts(GND)
14	Yellow/Green	Chassis Earth
15	-	No connection
16	-	No connection

Recomendations for
Installation of the CPS 650/B



FOR UK USERS ONLY

WARNING SYMBOLS

For your own safety and to avoid invalidation of the warranty all text marked as this paragraph should be read carefully.



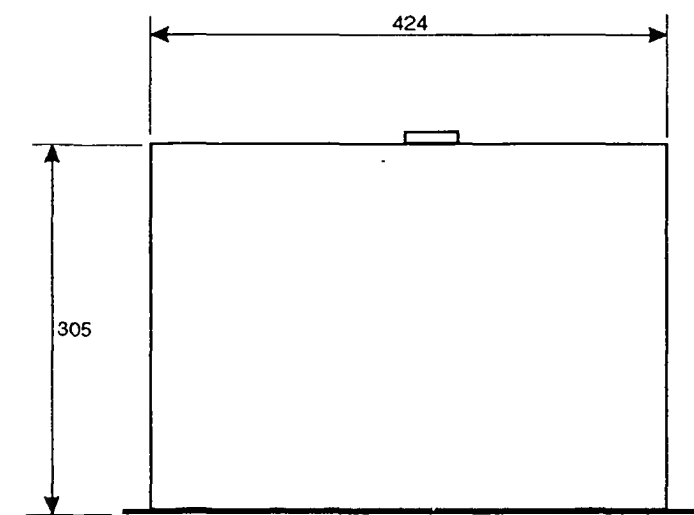
IMPORTANT WARNING
THIS APPLIANCE MUST BE EARTHED

The wires in the mains lead are coloured in accordance with the following code:

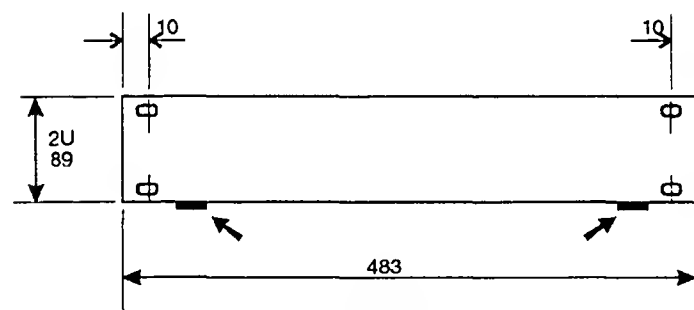
Green and Yellow:	Earth
Blue:	Neutral
Brown:	Live

- As the colours of the wires in the mains lead may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
- The wire which is coloured Green and Yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol.
 - The wire which is coloured Blue must be connected to the terminal in the plug which is marked with the letter N or coloured Black.
 - The wire which is coloured Brown must be connected to the terminal in the plug which is marked with the letter L or coloured Red

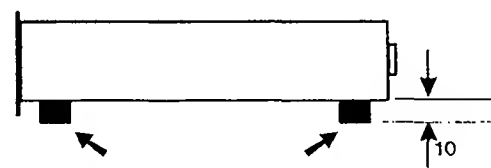
Dimensions



Top View



Front View



Side View

↗ Remove feet for rack mounting

CPS650/B DIMENSIONS

All dimensions in millimeters

Servicing

Servicing Components
Connector Configuration

Servicing

This operation should only be carried out by a competent service engineer.

Initial operational tests on the power supply can be carried out by switching the unit ON and checking the voltages present on the output connector on the back of the unit. While the unit remains disconnected from the mixing console the DC voltage rails are floating with respect to each other, that is they do not all have a common reference within the unit. When connection is made to the mixing console various output pins become earthed to a common star-point, which has a mains earth return in the power supply cable itself.

An indication of obvious fault condition is the failure of one or more of the front-panel LED's to light.

Any fault condition, with the exception of simple mains fuse failure due to underrating or an unusual mains input condition, will require removal of the top cover to enable fault correction. This is achieved using a No.1 or No.2 cross-head screwdriver to remove the five retaining screws and washers. Carefully lift the cover to avoid the earth connecting lead to the cover from snagging. Place the cover face down behind the unit.



WARNING: At the front of the unit just below the top cover is the MAINS PCB, which carries HIGH VOLTAGES directly from the mains input. Care MUST be taken when carrying out any servicing operation with the top cover removed.

SERVICING COMPONENTS



Replacement of any components should be undertaken only after switching the power supply unit OFF and disconnecting the mains supply lead from the power supply unit.

Replacement of any of the fuses and regulators in the power supply units is possible without the removal of circuit boards.

The fuses are held in open fuseholders on the board, close to the other components associated with that circuit. These can be carefully removed by hand. Ensure that the insulating fuse covers are replaced with the new fuses.

The TO3 package regulators are in sockets, and can be removed by unscrewing the two M3 screws on each end and lifting them by hand.

If the electrically insulating SIL PAD between the regulator and the heatsink bracket looks damaged then it should be replaced before replacing a regulator. The regulator fixing screws are used for an electrical connection between the regulator output and the rest of the circuit on the PCB: the case of the TO3 package is at the output potential of the device.

GENERAL

As with all electrical/electronic equipment care should be taken when handling this unit. Avoid general mishandling and do not drop. Avoid storage and operation in dusty locations and do not expose to corrosive atmospheres.



To avoid risk of fire do not expose this unit to rain or moisture.

Retain all packaging for transportation in the event of the unit requiring servicing. Retain this manual safely, along with all other relevant documents.

For touring/mobile transportation it is advisable to install the CPS650/B in a flight case to provide mechanical protection. Refer to your Soundcraft dealer for a suitable case.

Where the CPS650/B is enclosed in a touring case, provision must be made for adequate ventilation, and fan cooling is recommended in this situation. Ensure also that the heatsinks are kept clear of cables or other items which could be damaged by the heat dissipated under normal operating conditions.

Technical Specification

MAINS INPUT VOLTAGE RANGE:

240/220/200/120/110/100/90 V AC +/-10% @ 50/60Hz

RATED INPUT POWER (Max):

600 WATTS

MAINS FUSE RATING:

USE T6.3A/250V for all voltage settings

OUTPUTS

DC. VOLTAGE RAIL	MAX. OUTPUT CURRENT	MAX. NOISE
+17V	4.20 AMPS	-68dBu
-17V	4.20 AMPS	-68dBu
+24V (1)	3.0 AMPS	
-24V (2)	3.0 AMPS	
+48V	0.35 AMPS	-80dBu
+7.5V	1.25 AMPS	
-7.5V	1.25 AMPS	



All voltage and current measurements are to be taken at the console-end of the power supply cable.

OPERATING TEMPERATURE RANGE (Ambient):

-10 TO +50°C.

HUMIDITY:

Similar unit tested to 92% RH +/-5% Relative Humidity at 40 °C for 16 hours. Load switched between 20% and 100% at regular 30 minute intervals.

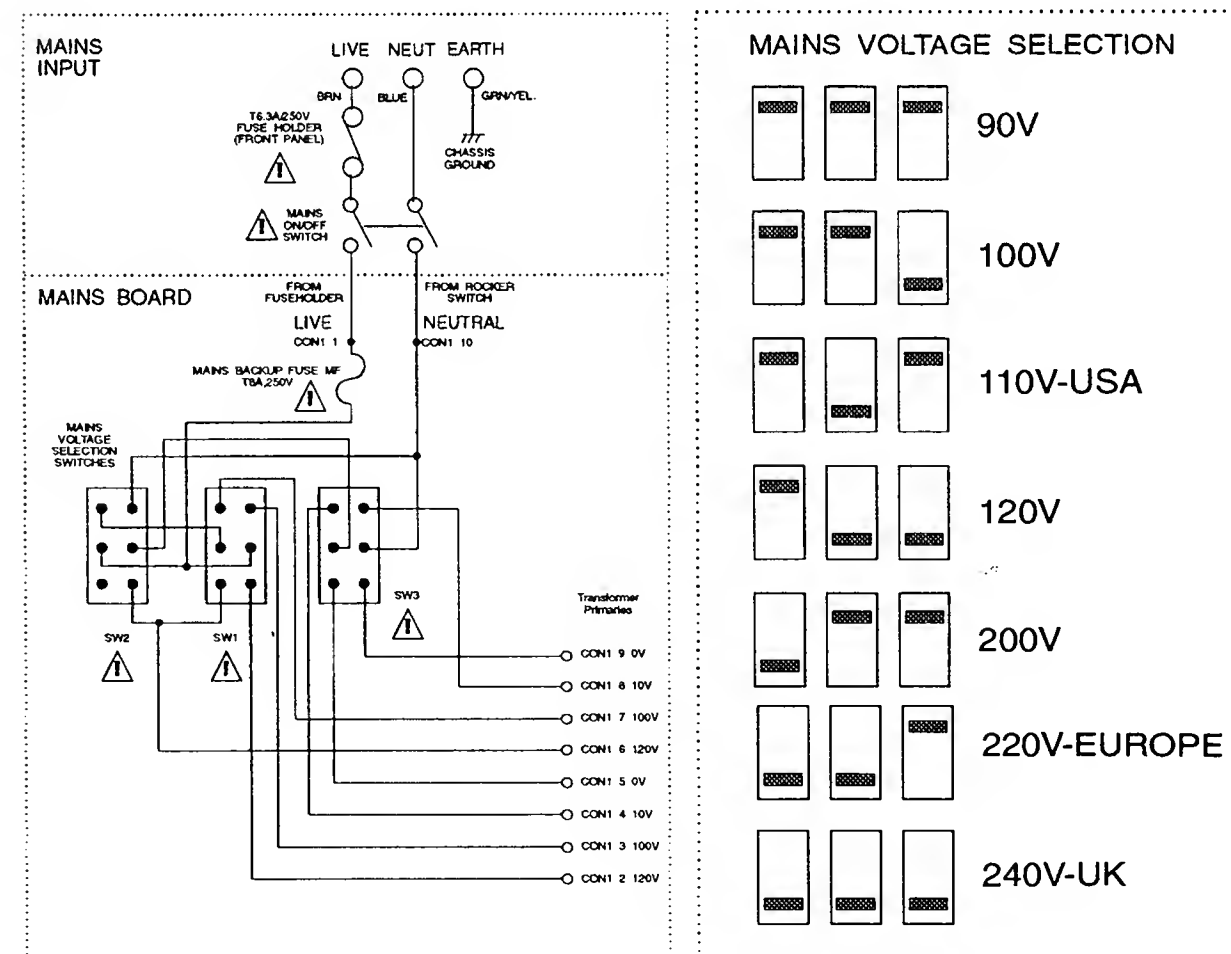
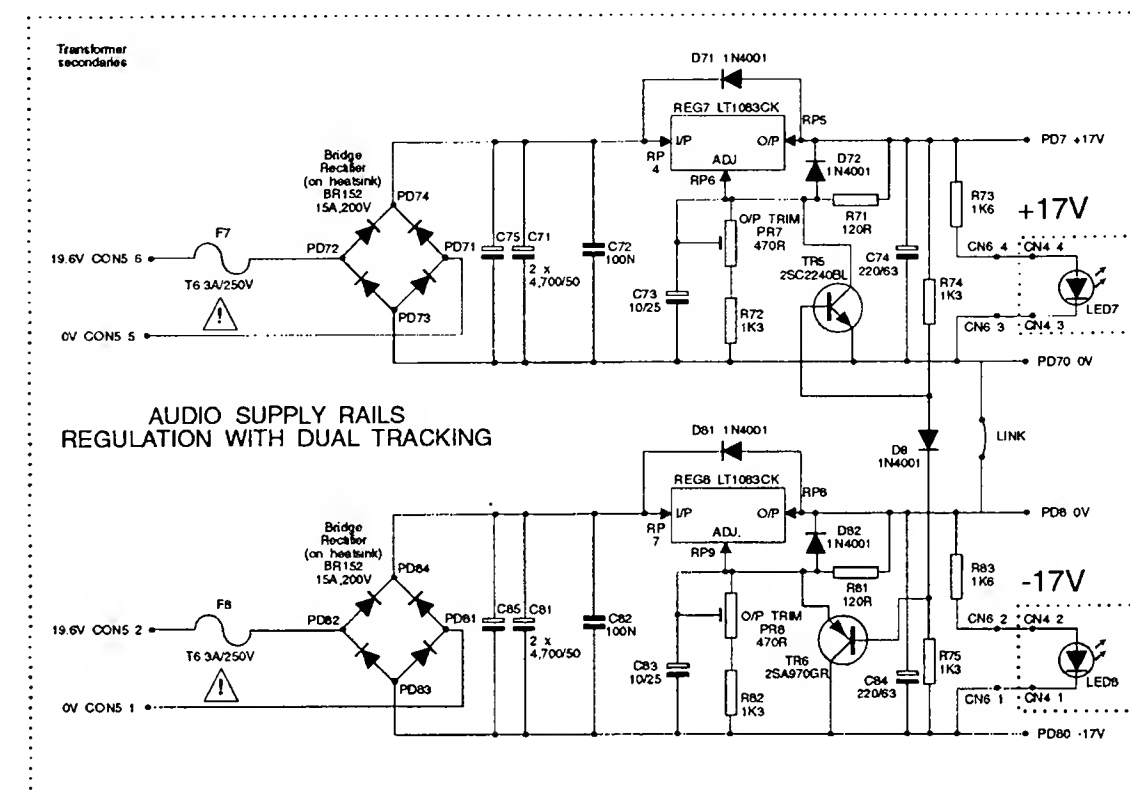
OVERALL DIMENSIONS:

HEIGHT:		89mm. (2U)
WIDTH:	Chassis	424mm.
	Front panel	483mm.
DEPTH:	(excl. connectors)	305mm.

WEIGHT:

(Excl. packing): 13Kg (Packed, incl. lead): 18Kg

CPS650/B SCHEMATIC DRAWING ED3136 sheet 2



NEGATIVE SUPPLY RAILS

1. For the +17 volts and -17 volts supplies, which provides power for all direct audio signal paths in the mixing console, the negative rail is derived from the same positive regulator circuit but the regulator output is connected to the "0V" reference of the complementary positive supply rail through a link on the circuit board. This means that the "0V" reference of the negative supply rail becomes the negative output with respect to the regulator output pin (for LT1083CK, the output terminal is the case). Note that the secondary windings on the transformer are fully isolated.

2. A +24V rail and a -24V rail are required in some consoles. The output rails of the power supply are floating, and where -24 volts is required in the console, the positive output of one +24V supply rail is connected to the '0V' reference of the other rail.

NOTE that this is done in the console.

The same technique is used to provide a complementary -7.5 volt rail to the +7.5 volt rail.

SHUTDOWN METHOD FOR +/-17.0 VOLT OUTPUTS

Under normal operating conditions, TR5 and TR6 are both inoperative, due to the potential divider R4, R14 and D3 which maintains approx. 0V on the base of the transistors.



FAILURE OF THE +17.0 VOLT OUTPUT

Should the +17.0 volt output shut down or the fuse blow, this will cause a negative potential on the base of TR6 to increase, and TR6 will conduct. The voltage on the adjust pin of REG8 will decrease and will close down REG8 and the -17.0 volt output.

The same principle of operation will also apply to the +17.0 volt output if the -17.0 volt output should shut down or the fuse blow.

CAUTION: Under no circumstances should TR5 or TR6 be removed as this will result in damage to the console under some fault conditions.

ATTENTION: If this power supply is momentarily short-circuited when fully loaded, it may protect itself by partial shutdown. Reset the power supply by either removing the load or by briefly turning off mains power.

Technical Specification

Circuit Description

The CPS650/B is a linear power supply, the operation of which avoids the induction of switching noise, associated with switch-mode designs, in audio signal paths. It has been possible to produce a design which is silent in operation, and which will function over a greatly improved range of mains input voltages. Additionally, the design of each supply is very similar and of a "modular" format that will assist when servicing.

Note: The CPS650/B circuit is detailed in ED3136

PRIMARY CIRCUIT

The mains supply is applied to the unit via the 3-pin IEC inlet on the unit back plate. The earth feed is led directly to the chassis earth studs on the chassis and lid.



At no time should this earth connection be broken.

The LIVE (black or brown) and NEUTRAL (white or blue) feeds are led to the double-pole, double-throw rocker switch on the front of the unit, so that live and neutral switching to the following circuitry is made simultaneously.

From this switch, the neutral feed is led directly to the MAINS PCB. The live feed passes through the USER-SERVICEABLE mains fuse situated in the fuseholder on the front, below the ON-OFF switch, and from there to the MAINS PCB.

On the MAINS PCB there is another fuse, in series with the first fuse in the LIVE feed, but of a higher rating (8A 250V TIME LAG). This is intended to protect the primary circuit in the event of the first fuse being replaced by another device, the breaking capacity of which is above the rating stated on the front panel of the unit.

MAINS VOLTAGE SELECTION is achieved through the three double-pole, double-throw switches on the MAINS PCB. These are used to select the correct combination of transformer primary windings across which the mains voltage is applied. User-access to these switches is via the three pluggable holes in the top cover. All connections to the MAINS PCB (live, neutral and transformer primary lead-outs) are made through a single, 10-way, latching connector.

SECONDARY CIRCUITS

The design of the regulator circuitry is essentially the same for each supply rail.

Each regulator circuit is fused at the input from the transformer secondary winding, to protect against an over-current condition, in the event of component failure in the regulator circuit.

Regulation is achieved using positive, adjustable voltage regulators, each housed in a TO3 package. The following is a general description of the operation of a single circuit.

1. The mains transformer steps-down the mains voltage to produce the required alternating voltage across each secondary winding. The appropriate pair of lead-outs (same colour) are connected to the REGULATOR PCB via two adjacent pins of a 6-way locking connector (same type as used on the MAINS PCB). One side of this secondary feed is led directly to the bridge rectifier, while the other is routed to the bridge rectifier via the secondary protective fuse. The level of the secondary voltage may be measured by applying an AC voltmeter across the desired pair of secondary lead-outs, points PD1 and PD2.

2. The voltage waveform between points PD3 and PD4 should be full-wave rectified, and smoothed by a high value electrolytic capacitor, so that it should appear as a DC voltage with a small AC 'ripple' element. This level may be measured with the voltmeter set for DC. A 100nF capacitor in parallel with the smoothing capacitor but closer to the regulator ensures its stability under any condition of capacitive load.

3. The regulator is adjustable, the output voltage being set by a preset, in series with a fixed resistance, between the adjustment pin and the "0V" reference. This allows a degree of adjustment approximately equal to:

NOMINAL RATED OUTPUT VOLTAGE (V_{dc}) -10% +(10% + 0.7 VOLTS)

The actual regulated output voltage level is given by:

$$V_{out} = V_{ref} \times (1 + R_{adj}/R1) + I_{adj} \times R2$$

$$\approx V_{ref} \times (1 + R_{adj}/R1) \quad \text{as } I_{adj} \text{ is negligible } (\sim 100\mu A)$$

where V_{out} is the output voltage, and V_{ref} is the voltage between the output and adjustment terminals of the regulator. R_{adj} is the sum of the trimmer resistor and series resistor to 0V, and $R1$ is the resistor between adjustment and output terminals. I_{adj} is the current flowing from the adjustment terminal.

For LT1083CK regulator:	REG7, 8	$R1 = 120R$ and V_{ref} is 1.25V
For LM833 regulator	REG1, 2	$R1 = 240R$ and V_{ref} is 1.25V
For LM317K regulator	REG5, 6	$R1 = 240R$
For TL783C regulator	REG30	$R1 = 82R$ and V_{ref} is 1.27V

4. The electrolytic capacitor in parallel with the adjustment resistor, R_{adj} , improves ripple rejection in the regulator, and also produces a time constant that causes the DC output of the regulator to rise more slowly when the unit is switched on. In the case of the +17 and -17 volts rails the rise time is about 3 seconds.

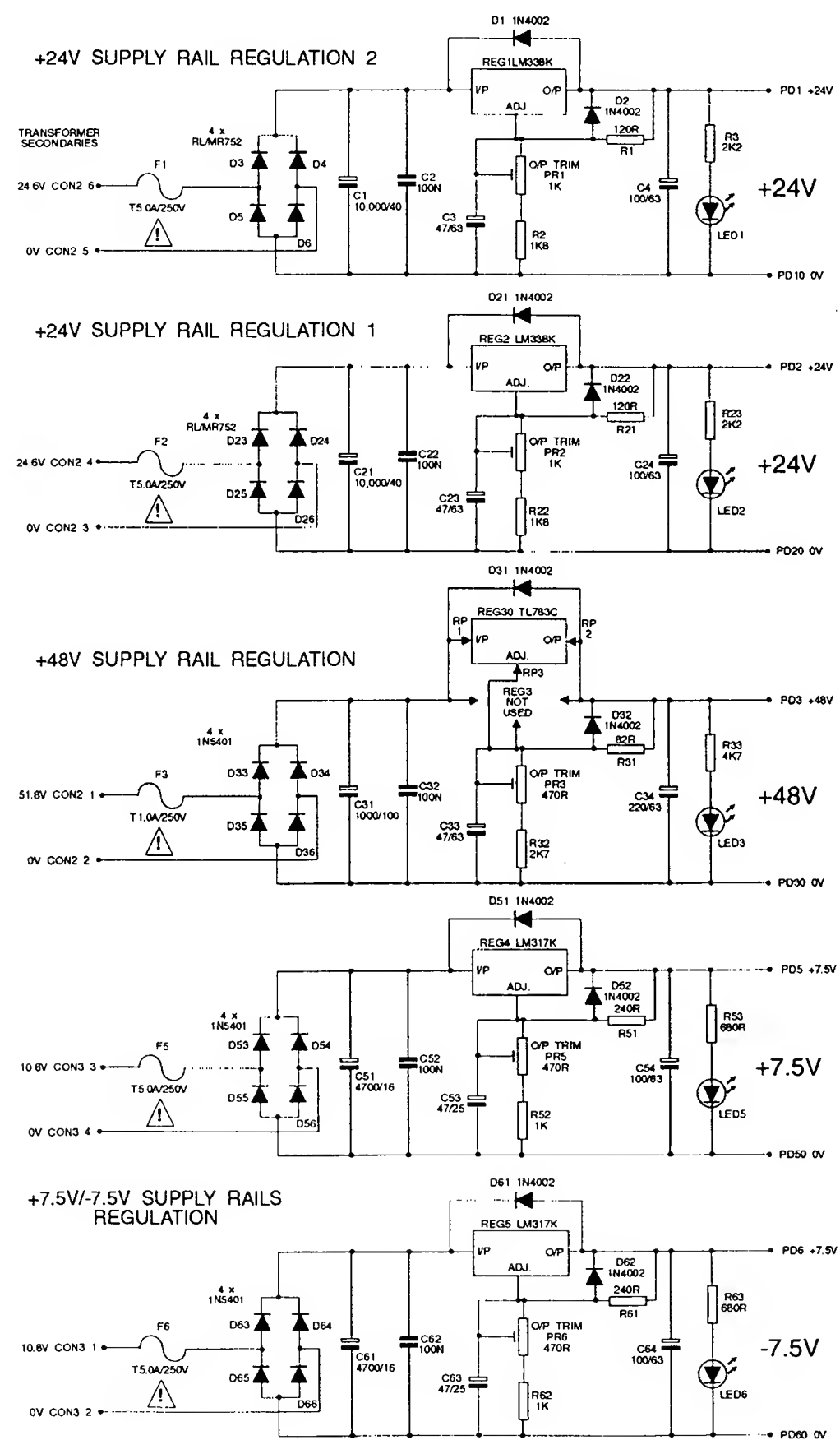
5. The output filter capacitor, between the regulator output and the "0V" reference, eliminates 'ringing' and a slow regulator shut-down time in the event of the output becoming short-circuited.

6. The two diodes around the regulator, situated between the adjust-output and output-input, provide protection for low-current paths within the regulator in the event of a reverse-bias condition. This occurs when the regulator input voltage is less than the voltage present at the regulator output, causing the output filter capacitor and the capacitor across the adjustment resistor to discharge 'backwards' through the circuit. In this situation the reverse-current would pass through the diodes instead of the regulator.

7. The LED and resistor in series, across the output of the regulator provide a visual indication that the regulator circuit is operational, with the LED situated on the forward edge of the circuit board, projecting through the front panel of the unit.

The resistor provides a current limit of approximately 10mA through the LED in normal operation.

8. The regulated output voltage between the regulator output and the "0V" reference line is fed to the DC OUTPUT CONNECTOR on the back of the unit by a pair of 32/0.2 insulated wires that are soldered directly to solder pads on the circuit board.



Circuit Description